

PROGRAM RESEARCH & DEVELOPMENT ANNOUNCEMENT

TABLE OF CONTENTS

1. Announcement

Introduction

Section A: Statement of Problem/ Objective

Section B: Award Information

Section C: Proposal Preparation Instructions

Section D: Basis for Award

Section E: Other Information to Offerors

2. Atch 1: Contract Data Requirements List (CDRL)

3. Atch 2: Model Contract with Representations and Certifications

4. DD Form 254: N/A

**Program Research and Development Announcement (PRDA)
No. 03-02-MLK**

TITLE: High Temperature Polymer Matrix Composites for Propulsion Transition

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PROPOSAL DUE DATE AND TIME: 16 DECEMBER 2002, 2:00 P.M. local time. *NOTE: Proposal receipt after the due date and time shall be governed by the provisions of FAR 52.215-1(c)(3).*

INTRODUCTION:

Air Force Research Laboratory, Materials and Manufacturing Directorate (AFRL/ML), Wright Research Site is soliciting technical and cost proposals on the research effort described in Section A below. Proposals should be addressed to the Contracting Point of Contact (POC) stated above. This is an unrestricted solicitation. Small businesses (as well as all offerors) are encouraged to propose on all or any part of this solicitation. Proposals submitted shall be in accordance with this announcement. *There will be no other solicitation issued in regard to this requirement.* Offerors should be alert for any PRDA amendments that may permit extensions to the proposal submission date.

Potential offerors are notified that effective 01 Jun 1998, in order to be eligible to receive any DOD award, contractors must be registered in the Central Contractor Registration (CCR) Database, unless a contractor meets any of the exceptions of DFARS 204.7302. On-line registration instructions can be accessed from the Wright Research Site Contracting Office home page at <http://www.wrs.af.mil/contract/> or the DISA CCR home page at <http://www.ccr.gov>.

SECTION A: Statement of Problem/Objective:

1. Statement of Objective/Needs:

a. Background:

High temperature polymer matrix composite materials (HTPMC) offer great potential to reduce the cost and weight of military turbine engine components. State-of-the-art HTPMCs, however, lack the durability to meet critical system lifetime performance requirements. DoD experience with current generation HTPMCs such as Avimid N, PMR-15, and AFR700B led to the implementation of these materials in various airframe and engine applications. This service experience, however, also pointed out that further development to improve environmental compliance, environmental durability and processability was needed to enable wider cost effective implementation. During the last decade, considerable investment in HTPMCs by the Air Force, other DoD laboratories, NASA, industry, and academia has led to the development of promising material systems capable of meeting the increasingly demanding requirements of current and future Air Force weapon systems. These materials may be suitable for affordable processing technologies such as conventional prepreg and low-pressure molding, conventional prepreg with autoclave processing, tape placement, solvent assisted resin transfer molding, or resin transfer molding.

b. Objective:

The objective of this program is to demonstrate the performance, processability, suitability, scale-up, and critical detail fabrication of these "next generation" addition polyimide matrix composites with graphite fiber reinforcement for propulsion applications. Turbine engine applications of HTPMCs are uniquely challenging in that they require flexible, low-cost processability of complex parts and the materials must demonstrate engine environmental durability. This program will enable industry transition of HTPMCs for near-term propulsion application needs, as well as address the needs of growth derivatives of production military engines.

c. Requirements:

In this phased exploratory and advanced development program the processing, mechanical, and environmental performance suitability and transition of "next generation" HTPMCs for high temperature engine applications will be established to enable insertion of these materials into military engines. The program will build on the latest technology developments in low-toxicity, environmentally durable, low-cost processable HTPMCs as described below:

Phase I: 1) Screening of new resin systems that meet near-term propulsion application performance requirements and 2) down-selection of the best candidates for affordable component fabrication.

Phase I Milestones:

I.1) Identification of candidate system components, material performance requirements and business case analysis for HTPMC insertion,

I.2) Demonstration of coupon level materials performance and processing suitability and select materials for Phase II with Air Force concurrence, and

I.3) Demonstration of critical element fabrication capability.

Phase II: 1) Scale-up and 2) producibility demonstration of down-selected system for use in turbine engine applications. The contractor will conduct composite fabrication and material process and performance optimization by coupon-scale analysis and element or sub-element fabrication for demonstration of necessary fabrication, processing, and properties for transition of the down-selected HTPMC system. The contractor shall utilize Integrated Product and Process Development (IPPD) methods to develop an optimized balance of requirements versus risk in order to identify the best technology option for transitioning to the customer.

Phase II Milestones:

II.1) Establish transition criteria including performance, processability, and life-cycle affordability compared to baseline materials,

II.2) Demonstrate affordable implementation of HTPMC material and processes, and

II.3) Demonstrate system application insertion readiness.

2. **Deliverable Items:**

a. Data Items:

- | | |
|----------------------|---|
| (1) DI-MISC-80711A/T | Scientific and Technical Reports (Final), ASREQ |
| (2) DI-MISC-80711/T | Scientific and Technical Reports, Contractor Billing Voucher, Mthly |
| (3) DI-FNCL-80331/T | Funds and Man-hours Expenditure Report, Mthly |
| (4) DI-MGMT-81468/T | Contract Funds Status Report (CFSR), Qtrly |
| (5) DI-MGMT-80507A/T | Project Planning Chart, Mthly |

- (6) DI-ADMN-81373/T Presentation Material, ASREQ
(7)DI-MISC-80711A/T Scientific and Technical Reports (Interim),
Mthly

b. Hardware: samples and application demo parts

3. Schedule:

a. Overall effort shall not exceed 64 months including both Phase I and Phase II (includes 60 months for technical effort and 4 months for Final Report).

b. Data Items: Deliver as shown on each data item.

c. Hardware: TBD. As proposed by offeror(s).

4. Other Requirements

a. Security Requirements: SECRET personnel clearance requirements are not foreseen at this time, but may apply depending on the design requirements proposed by the offerors.

b. INTERNATIONAL TRAFFIC IN ARMS REGULATION (ITAR) & PUBLIC LAW 98-94 (CONTROL OF UNCLASSIFIED TECHNICAL DATA WITH MILITARY OR SPACE APPLICATION): The data generated under the contract will be subject to ITAR and the contractor must gain access to technical data subject to the act. During the course of the effort, the contractor is expected to generate data subject to ITAR. Some of the technology is listed on the Military Critical Technology List (MCTL) and is subject to PL 98-94; therefore, a certified DD Form 2345 Militarily Critical Technical Data Agreement must be on file at <http://www.dlis.dla.mil/jcp> prior to award.

a. Government Furnished Property (GFP): None identified.

b. Size status: For purposes of this acquisition, the size standard is 500 employees, NAIC 541710.

SECTION B: Award Information

1. Expected Award Date: 1 Mar 2003

2. Total anticipated funding in thousands of dollars for the entire "HTPMC for Propulsion Transition" program (not per contract) is set forth below:

PHASE	FY02	FY03	FY04	FY05	FY06	FY07	TOTALS
I (6.2)	\$1K	\$305K	\$475K	\$475K	-0-	-0-	\$1,256K
II (6.3)	-0-	\$5K	\$429K	\$450K	\$450K	\$100K	\$1,434K
	\$1K	\$310K	\$904K	\$925K	\$450K	\$100K	\$2,690K

This funding profile is an estimate only and is not a promise for funding as all funding is subject to change due to Government discretion and availability.

3. Type of Contract/Instrument: Because of the technical unknowns with a research program such as this, the AFRL anticipates a cost-reimbursement type of contractual arrangement (either with or without fee). However, offerors are encouraged to propose the contractual relationship that best facilitates their technical and business approach. The realm of relationships could be as anticipated by AFRL or include cost-share or assistance type of relationships. The offeror should provide supporting rationale for their proposed contractual arrangement. AFRL reserves the right to award one or more contracts/instruments. Based upon the current available funding one award is anticipated at this time. AFRL may award all, part, or none of the proposals received as a result of this PRDA. See Section D below.

SECTION C: Proposal Preparation Instructions

1. General Instructions:

The technical/cost proposal submitted by the offerors in response to this PRDA are the only vehicles available to the offeror for receiving consideration. Each must stand on its own merit; only information provided in the proposals can be used in the evaluation process leading to an award. They should be prepared simply and economically, providing a straight forward, concise delineation of the proposed effort and associated capabilities. The technical proposal must be accompanied by a cost/price proposal because cost and technical considerations are reviewed simultaneously.

Offerors should consider proposal instructions contained in the AFRL PRDA/BAA Guide for Industry, which can be accessed on line at www.wrs.afrl.af.mil/contract. This guide was specifically designed to assist offerors in understanding the PRDA/BAA proposal process. Technical/management and cost volumes should be submitted in separate volumes, and must be valid for a minimum of 180 days. Proposals must reference the above announcement number. Offerors

must submit one original and 5 copies of their proposals. *Offerors are advised that only contracting officers are legally authorized to contractually bind or otherwise commit the government.* The cost of preparing proposals in response to this PRDA is not considered an allowable direct charge to any resulting or any other contract; however, it may be an allowable expense to the normal bid and proposal indirect cost as specified in FAR 31.205-18.

Communications: Offerors may communicate with AFRL/ML personnel for the purpose of clarifications only until the receipt date of technical proposals specified herein. After the proposal receipt date, AFRL/ML may talk directly with perspective offerors to obtain clarifications of proposals submitted up until the final Purchase Request (PR) Packages are received in the contracting office (AFRL/MLKN). After formal submission of the PR packages, the contracting officer or negotiator is the only point of contact with offerors.

Restrictions on Disclosure: Offerors should apply the restrictive notice prescribed in the provision of FAR 52.215-1(e) "Instructions to Offerors--Competitive Acquisition."

Notice to Foreign-Owned Firms: Foreign participation is prohibited at the prime level, but permitted at the sub-contracting level. Since this acquisition involves data that are subject to export control laws and regulations, only contractors who are registered and certified with the Defense Logistics Services Center (DLSC) and have a legitimate business purpose may participate in this solicitation. Contact the Defense Logistics Services Center, 74 Washington Avenue N., Battle Creek, Michigan 49117-3084 (1-800-352-3572) for further information on the certification process.

2. Technical/Management Proposal:

- a. Page Limitation: 25 pages, 12 point or larger, double spaced, single-sided, 8.5 by 11 inches. This limitation includes all information, e.g., indices, photographs, foldouts, appendices, attachments, etc. It does not apply to the offeror's proposed Statement of Work (SOW), which is limited to 10 pages. The government will not consider pages in excess of this limitation.
- b. The proposal shall include a discussion of the nature and scope of the research and the technical approach. Additional information on prior work in this area, descriptions of available equipment, data and facilities and resumes of personnel who will be participating in this effort should also be included as attachments

to the technical proposal. This volume shall include a SOW detailing the technical tasks proposed to be accomplished under the proposed effort and suitable for contract incorporation. *Do not include any proprietary information in the SOW.* Refer to the AFRL Guide referenced above to assist in SOW preparation.

c. Any questions concerning the technical proposal or SOW preparation shall be referred to the Technical POC cited above.

3. Cost/Business Proposal:

a. Separate the proposal into a business section and cost section. Adequate price competition is anticipated. Costs for Phase I should be proposed separately from Phase II effort.

b. The business section should contain all business aspects to the proposed contractual or instrument arrangements, such as type of contract/instrument, any exceptions to terms and conditions of the announcement model contract, any information not technically related, etc. Provide rationale for exceptions. If selected for negotiations, qualifying offerors may be required to submit a subcontracting plan.

c. Cost proposals have no limitations; however, offerors are requested to keep cost proposals to 25 pages as a goal. The proposal shall be furnished with supporting schedules and shall contain a personhour breakdown per task. Refer to the AFRL PRDA/BAA Guide for Industry for detailed proposal instructions.

SECTION D: Basis for Award

The selection of one or more sources for award will be based on an evaluation of each offeror's proposal (both technical and cost/price aspects) to determine the overall merit of the proposal in response to the announcement. The technical aspect, which is ranked as the first order of priority, shall be evaluated based on the following criteria that are of descending importance:

TECHNICAL:

- a. New and creative solutions
- b. The offeror's understanding of the scope of the technical effort
- c. Soundness of offeror's approach, including proposed Statement of Work (SOW)

d. The proposed approach is reasonable to demonstrate readiness for insertion into an Air Force turbine engine system

e. The offeror's past experience with the technology, including personnel and related facilities

COST/PRICE: Cost/Price includes the reasonableness and realism of the proposed cost and fee and consideration of proposed budgets and funding profiles. Cost/Price is a substantial factor, but ranked as the second order of priority.

Proposal Risk Assessment: Proposal risk will be individually assessed for the technical, cost and schedule areas. Proposal risk relates to the identification and assessment of the risks associated with an offeror's proposed approach as it relates to accomplishing the proposed effort. Tradeoffs of the assessed risk will be weighed against the potential payoff.

No other evaluation criteria will be used. The technical and cost proposals will be evaluated at the same time. Upon completion of evaluation, proposals will be classified into one of the following three categories:

Category I: Well conceived, scientifically and technically sound proposals pertinent to program goals and objectives, and offered by a responsible contractor with the competent scientific and technical staff and supporting resources needed to ensure satisfactory program results. Proposals in Category I are recommended for acceptance and normally are displaced only by other Category I proposals.

Category II: Scientifically or technically sound proposals requiring further development and are recommended for acceptance, but are at a lower priority than Category I.

Category III: Proposals not technically sound or do not meet agency needs.

The Air Force reserves the right to select for award of a contract or assistance instrument any, all, part or none of the proposal received. Award of a grant to universities or nonprofit institutions, or assistance instrument in lieu of a contract will be subject to the mutual agreement of the parties.

SECTION E: OTHER INFORMATION TO OFFERORS:

a. An Ombudsman has been appointed to hear concerns from offerors or potential offerors during the proposal development phase of this acquisition. The purpose of the Ombudsman is not to diminish the authority of the program director or Contracting Officer, but to communicate Contractor concerns, issues, disagreements, and recommendations to the appropriate government personnel. When requested, the Ombudsman shall maintain strict confidentiality as to the source of the concern. The Ombudsman does not participate in the evaluation of proposals or in the selection decision. Interested parties are invited to contact Lt. Col. Sam A. Lopez, AFRL/PK, telephone (937) 255-4813, e-mail sam.lopez@wpafb.af.mil. All routine communication concerning this acquisition should be directed to Nancy F.I. Stormer , Contracting Officer, telephone (937) 656-9887, email nancy.stormer@wpafb.af.mil .

b. Based upon market research, the Government is not using the policies contained in Part 12, "Acquisition of Commercial Items," in its solicitation for the described supplies or services. However, interested persons may identify to the contracting officer their interest and capability to satisfy the Government's requirement with a commercial item within 15 days of this notice.